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| Interview Summary | Application No. 08/471,890 | Applicant(s) HUFFMAN ET AL. | |
| | Examiner Dah-Wei Yuan | Art Unit 1795 | |

All participants (applicant, applicant's representative, PTO personnel):

(1) Dah-Wei Yuan. (3) _____.

(2) Jason Barron. (4) _____.

Date of Interview: 11,23,24 Sept 2009.

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☒ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
If Yes, brief description: _____.

Claim(s) discussed: 122-163.

Identification of prior art discussed: N/A.

Agreement with respect to the claims f) ☐ was reached. g) ☒ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: On September 11, 2009, Examiner Yuan suggested the incorporation of the limitation "cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents" into all the independent claims to place the application in condition for allowance. This limitation was agreed upon in the September 23, 2008 interview. Examiner Yuan sent Mr. Barron proposed examiner's amendments (attached to the end of this interview summary) for the instant product application and copending process application 08/486,669 that incorporated this limitation into all of the independent claims of the respective applications. On September 23, 2009, Mr. Barron faxed a draft amendment for the instant product application. Examiner Yuan did not accept the proposed amendment by applicants because some proposed claims were not supported by the disclosure as filed. For example, proposed claim 164 by applicant was drawn to "A substantially pure fullerene compound comprising a polyhedral carbon cage," which was not supported by the disclosure as filed. The original disclosure does not include the term fullerene, and the present day meaning of fullerene encompasses carbon nanotubes, which applicant did not conceive of or regard as their invention. On September 24, 2009, Examiner Yuan inquired whether applicants would accept the proposed examiner's amendments and requested a definite answer by the next business day. At one point during the interviews of September 2009, applicants' representative indicated that the September 11, 2009 proposed examiner's amendment for the process application would likely be accepted by applicants. In response to Examiner's Yuan inquiry on September 24, 2009, applicants filed supplemental responses in both the product and process applications the next business day that did not completely adopt the examiner's proposed amendments.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

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| | /Dah-Wei D. Yuan/ Supervisory Patent Examiner, Art Unit 1795 |
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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Attorney Docket No.: 7913ZY

Serial No.: 08/471,890

Proposed Examiner's Amendment for 08/471,890

IN THE SPECIFICATION:

Please replace the first paragraph on page 1, starting at line 1, with the following paragraph:

This is a continuation of ~~depending application~~ U.S. Patent Application having Serial No. 07/580,246, filed on September 10, 1990, now U.S. Patent No. 7,494,638, which is a continuation-in-part of ~~U.S.S.N. 575,254, filed on August 30, 1990. This is a continuation-in-part of depending United States~~ U.S. Patent Application having Serial Number 07/575,254 ~~575,254~~ that was filed on August 30, 1990, now abandoned.

IN THE CLAIMS:

Claim 122:

122. (Currently Amended) Purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

Claim 123:

123. (Currently Amended) Purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in solid form.

Claim 124:

124. (Currently Amended) Crystalline cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

Claim 125:

125. (Currently Amended) Purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in crystalline form.

Claim 126:

126. (Currently Amended) A macroscopic amount of purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

Claims 127-129:

Please cancel claims 127-129.

Claim 130:

130. (Currently Amended) A free-flowing particulate comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in microcrystalline form.

Claim 131:

131. (Currently Amended) A solid comprising a macroscopic amount of cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in crystalline form.

Claim 132:

Please cancel claim 132.

Claim 133:

133. (Currently Amended) A solid carbon product prepared by the process comprising:

- (a) vaporizing a carbon source in the presence of an inert quenching gas under conditions effective to provide a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents;
- (b) depositing the sooty carbon product on a collecting substrate;
- (c) removing the sooty carbon product from the collecting substrate;
- (d) contacting the sooty carbon product with a non-polar organic solvent effective to dissolve said cage molecules, said solvent being present in an amount effective to dissolve the cage molecules in said sooty carbon product; and
- (e) recovering from said resulting product formed when the sooty carbon product was contacted with said solvent a solid carbon product comprising said cage molecules in a macroscopic amount.

Claim 150:

150. (Currently Amended) A solid carbon product prepared by the process comprising: (a) evaporating a carbon source in the presence of an inert quenching gas under conditions effective to produce a sooty carbon product containing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, said cage molecules being present in said sooty carbon product in sufficient concentration to allow a macroscopic amount of said cage molecules to be separated from said sooty product;

- (b) collecting the sooty carbon product produced therefrom;
- (c) subliming the carbon product comprising said cage molecules from the sooty carbon product; and
- (d) condensing the sublimed carbon product comprising said cage molecules.

Claim 151:

151. (Currently amended) The solid carbon product of claim 150, wherein ~~the collecting substrate~~ in step (b), the sooty carbon product is collected on [is] a glass surface.

Claim 152:

152. (Currently Amended) The solid carbon product of claim 150 wherein the sublimation occurs at a temperature ranging from ~~100°-500°~~ 300°-400° C.

Claim 153:

153. (Currently Amended) The solid carbon product of claim ~~152~~ 150 wherein step (c) comprises heating the carbon product comprising said cage molecules in a vacuum or inert atmosphere at effective sublimation temperatures to extract the carbon product comprising said cage molecules from said sooty carbon product.

Reasons for examiner's amendment

Claims 127-129, and 132 are cancelled by this amendment. Claims 127-129, and 132 read on prior art and products of nature. See reasons given in paragraphs 9-14 of non-final Office action dated 9/12/2008. Other amendments were made to ensure that the term "cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents" appeared in all of the claims; otherwise, the claims would contain new matter. This term was agreed on during the interview dated September 23, 2008. Claim 151 is amended because it lacks antecedent basis. Claim 153 is amended since it does not further limit claim 152. In claim 152, the temperature range of 100°-500° C is not in the specification. Instead, the range of 300°-400° C is mentioned.

Note- Terminal Disclaimer

The terminal disclaimer filed on 2/22/2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Number 07/580,246 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Attorney Docket No.: 7913ZAZYX

Serial No.: 08/486,669

Proposed Examiner's Amendment for 08/486,669**IN THE SPECIFICATION:**

Please replace the first paragraph on page 1, starting at line 1, with the following paragraph:

This is a continuation of ~~co-pending application~~ U.S. Patent Application having Serial No. 08/236,933, filed on May 2, 1994, now U.S. Patent No. 7,473,410, which is a Continuation of Serial No. 07/855,959, filed on March 23, 1992, now abandoned, which is a Continuation of Serial No. 07/781,549, filed on October 22, 1991, now abandoned, which is a Divisional of Serial No. 07/580,246, filed on September 10, 1990, now U.S. Patent No. 7,494,638, which is a [c-i-p] continuation-in-part of Serial No. 07/575,254, filed on August 30, 1990, now abandoned. ~~This is a continuation-in-part of co-pending United States Patent Application having Serial Number 575,254 that was filed on August 30, 1990.~~

IN THE CLAIMS:

Claim 110:

110. (Currently Amended) A process for preparing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, comprising: (a) vaporizing elemental carbon in the presence of an inert quenching gas under conditions effective to form a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, said cage molecules being present in said sooty carbon product in amounts capable of extracting therefrom said cage molecules in macroscopic amounts; and (b) extracting said cage molecules in macroscopic amounts from said sooty carbon product.

Claim 111:

111. (Currently Amended) A process for preparing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents comprising: (a) vaporizing elemental carbon in the presence of an inert quenching gas under conditions effective to form a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in macroscopic amounts; (b) depositing the sooty carbon product on a collecting surface remote from situs of vaporization; (c) removing the sooty carbon product from the collecting surface; and (d) extracting a product comprising a macroscopic amount of said cage molecules from said sooty carbon product.

Claim 113:

113. (Currently Amended) The process according to claim 112 wherein extracting further comprises separating from said solvent said cage molecules in solid form.

Claim 116:

116. (Currently Amended) The process of claim 114 wherein separating said cage molecules in solid form from the solvent comprises evaporating the solvent.

Claim 122:

122. (Currently Amended) The process of claim 120 wherein subliming comprises heating the cage molecules in a vacuum or inert atmosphere at effective sublimation temperatures to extract the cage molecules from said sooty

carbon product.

Claim 144:

144. (Currently Amended) A process for preparing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, comprising: (a) vaporizing elemental carbon in the presence of an inert quenching gas under conditions effective to form a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, said cage molecules being present in said sooty carbon product in amounts capable of extracting therefrom said cage molecules in solid form; and (b) extracting in solid form said cage molecules from said sooty carbon product.

Claim 145:

145. (Currently Amended) A process for preparing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, comprising (a) vaporizing elemental carbon in the presence of an inert quenching gas at a pressure sufficient to generate a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, said cage molecules being present in said sooty carbon product in sufficient amounts to produce and collect therefrom crystalline cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents; (b) separating said cage molecules from said sooty carbon product under conditions effective to recover said crystalline cage molecules.

Claim 151:

151. (Currently Amended) A process for producing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents comprising: (a) vaporizing elemental carbon in an atmosphere of an inert gas at a pressure sufficient to generate a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents; said cage molecules being present in sufficient quantities to recover therefrom said cage molecules in amounts to be discernible as a colored solid; (b) separating said cage molecules from said sooty carbon product under conditions effective to recover therefrom [a] colored crystalline cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

Claim 155:

155. (Currently Amended) The process according to claim 151 wherein the crystalline cage molecules [is] are purified crystalline cage molecules.

Claim 156:

156. (Currently Amended) A process for preparing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents comprising vaporizing elemental carbon selected from the group consisting of graphite, amorphous carbon and glassy carbon in an inert quenching gas at a pressure of at least 50 torr so as to generate a carbon soot comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents and

separating said cage molecules from said soot under conditions effective to recover purified crystalline cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents therefrom.

Claim 158:

158. (Currently Amended) A process for preparing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, comprising: (a) vaporizing elemental carbon in the presence of an inert quenching gas at a pressure ranging from less than 1 atmosphere up to a pressure of 10 atmospheres under conditions effective to form a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in quantities sufficient to isolate said cage molecules as a solid when extracted from the sooty carbon product; (b) depositing the sooty carbon product on a collecting surface remote from said situs of vaporization; (c) removing the sooty carbon product from the collecting surface; and (d) extracting said cage molecules from said sooty carbon product in quantities sufficient to isolate said cage molecules as a solid when extracted from the sooty carbon product.

Claim 159:

159. (Currently Amended) A process for preparing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, comprising: (a) vaporizing elemental carbon in the presence of an inert quenching gas under a pressure ranging from less than 1 atmosphere up to 10 atmospheres under conditions effective to form a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in quantities sufficient to isolate said cage molecules as a discernible solid when extracted from the sooty carbon product; (b) extracting said cage molecules from said sooty carbon product in quantities sufficient to isolate said cage molecules as a discernible solid.

Claim 165:

165. (Currently Amended) The process according to claim 158 or 159 wherein the product is substantially purified cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

Claim 167:

167. (Currently Amended) The process according to claim 158 or 159 wherein the pressure ~~of the~~ ranges from 50 to 400 torr.

Claim 172:

172. (Currently Amended) A process for preparing cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents, comprising: (a) vaporizing elemental carbon to form vapor in an atmosphere of an inert gas; (b) quenching said carbon vapor in an inert gas under conditions sufficient to effectively condense and nucleate said vapor to form a sooty carbon product comprising cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents in sufficient quantities to extract therefrom an amount sufficient to collect said cage molecules as a crystalline product; (c) collecting said sooty carbon product; (d) separating said cage molecules from said sooty carbon product and recovering therefrom said cage molecules in crystalline form.

Claim 176:

176. (Currently Amended) The process according to claim 172 wherein the cage molecules recovered therefrom is purified crystalline cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents.

Claims 179-183

Please cancel claims 179-183.

Reasons for examiner's amendment

Claim 179 is cancelled because the term "cage moiety consisting of carbon atoms" is new matter. If the term were to be amended as "cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents," then claim 179 would be identical to claim 110. All independent claims were amended to ensure that the term "cage molecules consisting of carbon atoms that are soluble in non-polar organic solvents" is recited. Applicant agreed to this term in the interview on September 23, 2008.

Claims 180-183 are cancelled since they are non-elected claims drawn to the product; the previously examined claims are method claims elected by original presentation. In addition, there is a restriction requirement between the product and the method in the parent application 07/580,246.

Claim 167 is amended to fix an indefiniteness problem.

Note-Terminal Disclaimer

The terminal disclaimer filed on 8/22/2001 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Number 08/236,933 has been reviewed and is accepted. The terminal disclaimer has been recorded.